

**PROGRAM CONCENTRATION:** Architectural, Construction,  
Communication, and Transportation  
**CAREER PATHWAY:** Maritime Studies  
**COURSE TITLE:** Maritime Studies Applications

**Course Description:** This course is designed to provide students interested in the maritime industry with entry level skills for shoreside and seagoing careers. Access to water and maritime industry facilities are needed in order to complete skills training necessary for this pathway; these types of activities may introduce stress not generally found in a typical classroom. There may be a requirement for after-school or weekend hours.

Students will also expand their knowledge of the industry and receive specialized training to make the connection between the classroom and the maritime industry. In addition, students will participate in simulations and have active involvement in scenarios at a port and/or other maritime facilities. Mastery of standards through project-based learning, interviews with industry professionals, technical skills practice, leadership development activities and involvement in maritime related associations will provide students with a competitive edge for entry into government/military services, the global market and/or post-secondary education.

**ACCT-MSA-1. Demonstrate skills necessary for shoreside careers in the maritime industry. Students will:**

- a. Define the scope of regulatory compliance as related to terminal operations.
- b. Use concepts related to regulatory compliance and terminal operations to solve logistics problems.
- c. Analyze logistics principles to include packaging, warehousing and materials handling, transportation systems, and supply chain management basics.

**Academic Standards**

*ELA9LSV2: The student formulates reasoned judgments about written and oral communication in various media genres. The student delivers focused, coherent, and polished presentations that convey a clear and distinct perspective, demonstrate solid reasoning, and combine traditional rhetorical strategies of narration, exposition, persuasion, and description.*

*When responding to written and oral texts and media (i.e., television, radio, film productions, and electronic media), the student:*

- b. Analyzes the types of arguments used by the speaker, including argument by authority, emotion, and logic.*
- c. Formulates judgments about ideas under discussion and supports those judgments with convincing evidence.*

- SCSh6: Students will communicate scientific investigations and information clearly.*
- a. Use data as evidence to support scientific arguments and claims in written or oral presentations.*
- SCSh9: Students will enhance reading in all curriculum areas by:*
- a. Read technical texts related to various subject areas.*

**ACCT-MSA-2. Demonstrate skills necessary for employment in the various seagoing (deckside) careers in the maritime industry. Students will:**

- a. List and explain the purpose of various vessel markings, including loadline and plimsol marks, draft marks, International Maritime Organization (IMO) number, vessel name, home port, symbols, etc.
- b. Given barometric pressure readings, interpret generally anticipated changes in weather conditions.
- c. Differentiate between various maritime lines and their intended use.
- d. Employ proper line handling and knot tying for anchoring and mooring situations.
- e. Navigate a vessel using simulator software according to a given scenario.

**Academic Standards**

*ELA9LSV1: The student participates in student-to-teacher, student-to-student, and group verbal interactions. The student*

- a. Initiates new topics and responds to adult-initiated topics.*
- b. Asks relevant questions.*
- c. Responds to questions with appropriate information.*
- d. Actively solicits another person's comments or opinions.*
- e. Offers own opinion forcefully without domineering.*

**ACCT-MSA-3. Demonstrate skills necessary for employment in the various seagoing (engineering) careers in the maritime industry. Students will:**

- a. Calculate and measure voltage, resistance and amperage in basic electrical systems.
- b. Explain and demonstrate the impact of loading an item to a specific location in relationship to vessel stability and the basic principles of center of gravity, weight, buoyancy and external forces.
- c. Develop an understanding of onboard electrical system requirements and power generation and distribution.
- d. Describe the principle of cathodic protection.
- e. Detail the importance of and exercise preventative maintenance schedules for maritime equipment.

- f. Outline cause and effect of failure to follow preventative maintenance schedules in relationship to equipment degradation and the resulting cascading impacts if not followed.
- g. Given a ship's systems diagram and color scheme, participate in locating equipment including machinery, valves, and piping.
- h. Under supervision at a maritime facility, participate in the operation of a vessel's firefighting system.
- i. Sketch a ship's system to include the firefighting system, lube/oil system, diesel system, electrical system, etc.

**Academic Standards**

*MM2A2: Students will explore exponential functions.*

- a. *Extend properties of exponents to include all integer exponents.*
- e. *Understand and use basic exponential functions as models of real phenomena.*

*MM2P2: Students will reason and evaluate mathematical arguments.*

- b. *Make and investigate mathematical conjectures.*
- c. *Develop and evaluate mathematical arguments and proofs.*

*MM2P3: Students will communicate mathematically.*

- a. *Organize and consolidate their mathematical thinking through communication.*
- d. *Use the language of mathematics to express mathematical ideas precisely.*

*MM2P4: Students will make connections among mathematical ideas and to other disciplines.*

- a. *Recognize and use connections among mathematical ideas.*
- b. *Understand how mathematical ideas interconnect and build on one another to produce a coherent whole.*
- c. *Recognize and apply mathematics in contexts outside of mathematics.*

*MM2P5: Students will represent mathematics in multiple ways.*

- a. *Create and use representations to organize, record, and communicate mathematical ideas.*
- b. *Select, apply, and translate among mathematical representations to solve problems.*
- c. *Use representations to model and interpret physical, social, and mathematical phenomena.*

*SCSh2: Students will use safety standard practices for all classroom laboratory and field investigations.*

- a. *Follow correct protocol for identifying and reporting safety problems and violations.*

*SCSh8: Students will understand important features of the process of scientific inquiry.*

- c. *Scientists use practices such as peer review and publication to reinforce the integrity of scientific activity and reporting.*

- d. *Science disciplines and traditions differ from one another in what is studied, techniques used, and outcomes weighed.*

**ACCT-MSA-4. Demonstrate skills related to firefighting in the maritime industry.**  
**Students will:**

- a. Apply knowledge to practical application of fire hoses, nozzles, streams, and foam, including fire hydraulics, fire hoses, hose care, maintenance, inspection, hose appliances, hose rolls, fire hose evolutions, nozzles, etc.
- b. Compare and contrast fire suppression operations and understand offensive versus defensive operations, including operating hose lines, protecting exposures, jettisoning, and fire classification.
- c. Classify by function and demonstrate proficiency in the use of fire fighter tools and equipment, including functions, phases of use, tool staging and maintenance.
- d. Demonstrate proper use and knowledge of classification of fire extinguishers, fire extinguisher placement, methods of fire extinguishments, types of extinguishing agents, fire extinguisher design/characteristics, and care of fire extinguishers.

**Academic Standards**

*ELA9W3: The student uses research and technology to support writing.*

- a. *Formulates clear research questions and utilizes appropriate research venues (i.e., library, electronic media, personal interview, survey) to locate and incorporate evidence from primary and secondary sources.*
- b. *Uses supporting evidence from multiple sources to develop the main ideas within the body of an essay, composition, or technical document.*
- c. *Synthesizes information from multiple sources and identifies complexities and discrepancies in the information and the different perspectives found in each medium (i.e., almanacs, microfiche, news sources, in-depth field studies, speeches, journals, or technical documents).*

*SCSh1: Students will evaluate the importance of curiosity, honesty, openness, and skepticism in science.*

- a. *Exhibit the above traits in their own scientific activities.*

*SCSh5: Students will demonstrate the computation and estimation skills necessary for analyzing data and developing reasonable scientific explanations.*

- a. *Trace the source on any large disparity between estimated and calculated answers to the problem.*
- b. *Consider possible effects of measurement errors on calculations.*
- c. *Recognize the relationship between accuracy and precision.*
- d. *Express appropriate numbers of significant figures for calculated data, using scientific notation where appropriate.*

**ACCT-MSA-5. Demonstrate knowledge and skills necessary for dealing with hazardous materials, including hazardous communications, proper handling and disposal, and response to unintended release. Students will:**

- a. List and define available reference information relating to hazmat, including MSDS, Emergency Response Guidebook, manufacturers' websites, etc.
- b. Detail the importance of segregation of cargo, including container separation, bulk liquid separation, and cross contamination.
- c. Given a scenario develop a response plan to include scene control, safety precautions/procedures, and levels of damage caused by chemicals.
- d. Determine personal protective equipment for handling hazmat and responding to hazmat situations.

**Academic Standards**

*ELA9RC3: The student acquires new vocabulary in each content area and uses it correctly.*

- a. *Demonstrates an understanding of contextual vocabulary in various subjects.*
- b. *Uses content vocabulary in writing and speaking.*

**ACCT-MSA-6. Demonstrate skills necessary for communications in all aspects of maritime activity. Students will:**

- a. Identify communications protocol to include terminology, equipment, radio channel purpose, and secure and unsecure operation.
- b. Operate shipboard communication equipment to include voice tubes, messengers, public address system, call box, Very High Frequency (VHF) Radio, Single-Sideband radio, Emergency Position Indicating Radio Beacon (EPIRB).

**Academic Standards:**

*ELA9RC4: The student establishes a context for information acquired by reading across curriculum.*

- a. *Explores life experiences related to subject area content.*
- b. *Discusses in both writing and speaking how certain words and concepts relate to multiple subjects.*

*ELA9W2: The student demonstrates competence in a variety of genres –specifically informational (expository) writing and technical writing.*

*The student produces expository (informational) writing to convey information and ideas from primary and secondary sources accurately and coherently; the student:*

- a. *Engages the interest of the reader.*

- b. *Formulates a coherent thesis or controlling idea.*
- c. *Coherently develops the controlling idea and/or supports the thesis by incorporating evidence from at least one secondary source.*
- d. *Follows an organizational pattern appropriate to the type of composition.*

**ACCT-MSA-7. Demonstrate skills necessary for preventing and responding to emergencies. Students will:**

- a. List and define preventative measures for emergencies, including the process of securing for sea and reviewing assigned emergency responsibilities
- b. Given a scenario, assess unsecure items and determine appropriate procedure for making items secure.
- c. Demonstrate proper response to man overboard, taking on water, and abandon ship emergencies.
- d. Perform tests associated with water survival skills.

**Academic Standards:**

*ELA9C1: The student demonstrates understanding and control of the rules of the English language, realizing that usage involves the appropriate application of conventions and grammar in both written and spoken formats.*

- a. *Demonstrates an understanding of proper English usage and control of grammar, sentence and paragraph structure, diction, and syntax.*
- b. *Correctly uses clauses (i.e., main and subordinate) and mechanics of punctuation (i.e. end marks, commas, semicolons, and quotation marks).*
- c. *Demonstrates an understanding of sentence construction (i.e., subordination, proper placement of modifiers) and proper English usage (i.e., consistency of verb tenses).*

**ACCT-MSA-8. Demonstrate skills associated with the familiarization and utilization of maritime reference manuals. Students will:**

- a. Plan a trip and simulate navigation to a specific location utilizing Light Lists/List of Lights, Coast Pilots/Sailing Directions, Tide Tables/Tidal Current Tables, nautical charts, bearings, GPS readings, and plotting equipment.
- b. Apply navigational rules, while on a simulated trip to include steering and sailing rules, lights and shapes, sound and light signals and exemptions.

**ACCT-MSA-9. Demonstrate knowledge of shipboard watchkeeping. Students will:**

- a. Explain fitness for duty, watch arrangements/principles, certification, and voyage planning related to watchkeeping international standards.

- b. Interpret international standards for watchkeeping at sea to include navigational watch, engineering watch, and radio watch.
- c. Compare and contrast watchkeeping at sea with watchkeeping in port to include watch arrangements, taking over the watch, performing the watch, and watchkeeping conditions.

### **Reading Across the Curriculum**

#### **Reading Standard Comment**

After the elementary years, students engage in reading for learning. This process sweeps across all disciplinary domains, extending even to the area of personal they experience text in all genres and modes of discourse. In the study of various disciplines of learning (language arts, mathematics, science, social studies), students must learn through reading the communities of discourse of each of those disciplines. Each subject has its own specific vocabulary, and for students to excel in all subjects, they must learn the specific vocabulary of those subject areas in context.

Beginning with the middle grades years, students begin to self-select reading materials based on personal interests established through classroom learning. Students become curious about science, mathematics, history, and literature as they form contexts for those subjects related to their personal and classroom experiences. As students explore academic areas through reading, they develop favorite subjects and become confident in their verbal discourse about those subjects.

Reading across curriculum content develops both academic and personal interests in students. As students read, they develop both content and contextual vocabulary. They also build good habits for reading, researching, and learning. The Reading Across the Curriculum standard focuses on the academic and personal skills students acquire as they read in all areas of learning.

Students will enhance reading in all curriculum areas by:

- a. Reading in all curriculum areas
  - Read a minimum of 25 grade-level appropriate books per year from a variety of subject disciplines and participate in discussions related to curricular learning in all areas.
  - Read both informational and fictional texts in a variety of genres and modes of discourse.
  - Read technical texts related to various subject areas.

b .Discussing books

- Discuss messages and themes from books in all subject areas.
- Respond to a variety of texts in multiple modes of discourse.
- Relate messages and themes from one subject area to messages and themes in another area.
- Evaluate the merit of texts in every subject discipline.
- Examine author's purpose in writing.
- Recognize the features of disciplinary texts.

c. Building vocabulary knowledge

- Demonstrate an understanding of contextual vocabulary in various subjects.
- Use content vocabulary in writing and speaking.
- Explore understanding of new words found in subject area texts.

d. Establishing context

- Explore life experiences related to subject area content.
- Discuss in both writing and speaking how certain words are subject area related.
- Determine strategies for finding content and contextual meaning for unknown words.

### **CTAE Foundation Skills**

The Foundation Skills for Career, Technical and Agricultural Education (CTAE) are critical competencies that students pursuing any career pathway should exhibit to be successful. As core standards for all career pathways in all program concentrations, these skills link career, technical and agricultural education to the state's academic performance standards.

The CTAE Foundation Skills are aligned to the foundation of the U. S. Department of Education's 16 Career Clusters. Endorsed by the National Career Technical Education Foundation (NCTEF) and the National Association of State Directors of Career Technical Education Consortium (NASDCTEc), the foundation skills were developed from an analysis of all pathways in the sixteen occupational areas. These standards were identified and validated by a national advisory group of employers, secondary and postsecondary educators, labor associations, and other stakeholders. The Knowledge and Skills provide learners a broad foundation for managing lifelong learning and career transitions in a rapidly changing economy.



Implementation date  
Fall 2012

- CTAE-FS-1 Technical Skills:** Learners achieve technical content skills necessary to pursue the full range of careers for all pathways in the program concentration.
- CTAE-FS-2 Academic Foundations:** Learners achieve state academic standards at or above grade level.
- CTAE-FS-3 Communications:** Learners use various communication skills in expressing and interpreting information.
- CTAE-FS-4 Problem Solving and Critical Thinking:** Learners define and solve problems, and use problem-solving and improvement methods and tools.
- CTAE-FS-5 Information Technology Applications:** Learners use multiple information technology devices to access, organize, process, transmit, and communicate information.
- CTAE-FS-6 Systems:** Learners understand a variety of organizational structures and functions.
- CTAE-FS-7 Safety, Health and Environment:** Learners employ safety, health and environmental management systems in corporations and comprehend their importance to organizational performance and regulatory compliance.
- CTAE-FS-8 Leadership and Teamwork:** Learners apply leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.
- CTAE-FS-9 Ethics and Legal Responsibilities:** Learners commit to work ethics, behavior, and legal responsibilities in the workplace.
- CTAE-FS-10 Career Development:** Learners plan and manage academic-career plans and employment relations.
- CTAE-FS-11 Entrepreneurship:** Learners demonstrate understanding of concepts, processes, and behaviors associated with successful entrepreneurial performance.